

Strut Measurement

**Ed Raether
Mwrench**

The purpose of this measurement is to determine if a front strut is bent. At this time, not enough data is available to allow precise measurements to determine which strut is bent, only that there is a difference between the struts which would manifest itself in a camber variance from side to side. Data is being collected and in the near future it will be possible to measure a strut and determine if it is bent. Typically if one corner of the vehicle is subjected to an impact and or a wheel has been severely damaged, then it is highly likely that the strut or some other suspension component has been bent or deformed.

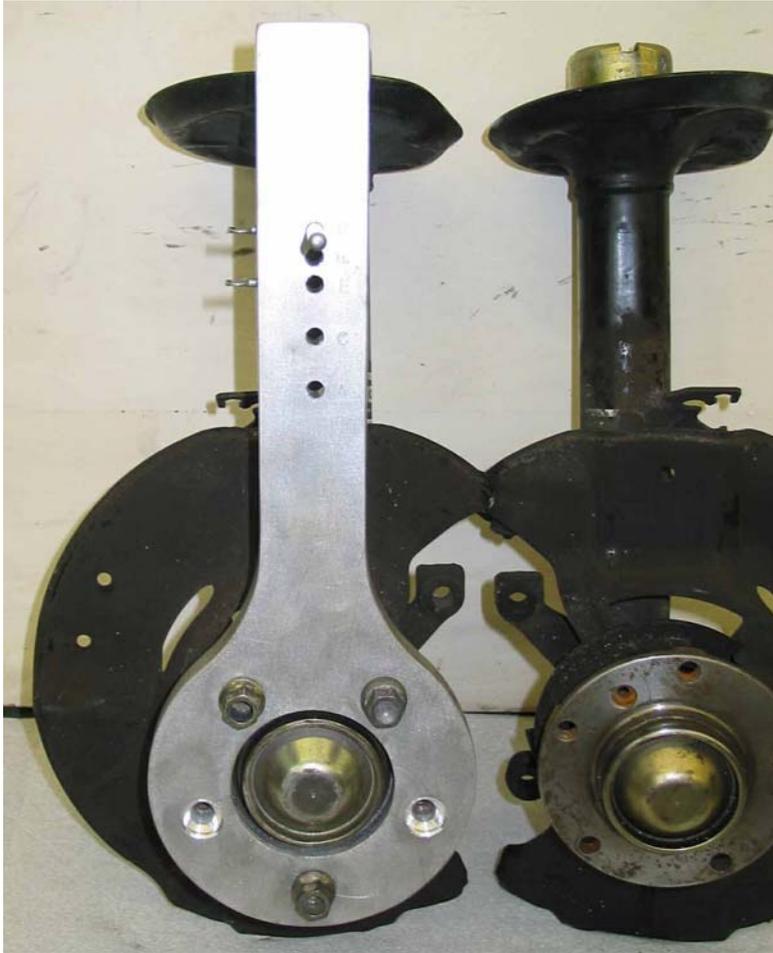
- 1. Raise the front of the vehicle and remove both front tires.**
- 2. Inspect the brake rotor flange and clean all rust and contamination off the flange. Failure to do so will result in erroneous readings. The pictures shown below are good example; in this case the rotors were off so the hub flange was used. Either way is OK. The hub flange will provide more accuracy.**



Hubs are before cleaning

Hubs cleaned with “Scotchbrite”

- 3. Mount the strut measurement gage to the rotor or hub as shown below. Be sure to use at least three lug bolts clocked in the position as shown for highest degree of accuracy. Tighten snugly but do not use extreme torque.**



4. Loosen wing nut and feed measurement rod thru hole “G” of the tool until it just touches the strut. Make sure all dirt and contamination is off the strut in the measurement area. It is also suggested to measure the strut that was not subjected to damage first. Tighten the wing nut on the side of the gage to hold the measurement rod in place. **Do not over tighten wing nut, just snug up.**



5. Remove tool from the reference strut and attach to the opposite strut. Be careful not to allow the measurement rod to come in contact with the strut during the attachment of the tool to the rotor. Again make sure the strut is clean in the area where the measurement rod will pass or come in contact with the strut. After attachment, gently rotate the tool to allow the measurement rod to swing past the strut, observe the clearance if any. If the measurement rod does not come in contact with the strut and there is clearance, there is a difference between the struts. A gap of 0.5mm (.0192") will equal 0.1 degrees of camber difference. In the illustration shown below, the strut was severely bent due to an altercation with a curb at speed. The gap shown was ~10mm which equals 2 degrees difference.



Measurement rod set on good strut first

Measurement rod showing the difference

6. If the measurement rod is reset (on the damaged strut) to just touch as shown below, and then taken to the good strut, please observe the results shown in picture #2 below.



Picture #1
Measurement rod calibrated to damaged strut



Picture #2
Measurement rod will not clear the strut and difference will be hard to measure

7. The strut may be bent so that the top of the wheel is bent inward or outward. If the reference tool is set to a known good strut then here are examples of what can be expected in each case. I am re-labeling previous pictures for this example.



**Picture #3
Top of the wheel outward (additional positive camber)**



**Picture #4
Top of the wheel inward (additional negative camber)**

If it is desired to measure the differences, Picture #3 is ideal because a feeler gauge may be inserted between the measurement rod and the strut. If the wheel is bent inward, then the measurement rod must be reset to the damaged strut and the tool moved to the good strut to measure the gap.

General:

Wheel bearing runout may affect the readings but should be less than 0.4mm at hole positioning "G". Bearing runout and wheel bearing slop can be observed by gently pushing/pulling on the top of the tool when attached to the rotor/hub and observing the clearance between the measurement rod and the strut. Comments and feedback are welcomed.